REMARKS

Claims 4, 8, 20, and 22 have been amended. Claims 4-14 and 16-22 are pending, with claims 4, 8, 20, and 22 being independent.

Attached hereto is an Appendix entitled "Version with Markings to Show Changes Made" which is a marked-up version of the portions of the application which have been amended by the present amendment, with brackets indicating deleted matter and underlining indicating added matter.

Submitted herewith is a request for change of attorney docket number, entry of which is respectfully requested.

Claim 20 was objected to because there was no antecedent basis for "said DC power supply means" in line 18. Accordingly, claim 20 has been amended to change "said DC power supply means" to "said DC power storage means" to be consistent with "DC power storage means" in line 16 of claim 20 as it appears on pages 9-10 of the amendment of September 13, 2002. Accordingly, it is respectfully requested that the objection to claim 20 be withdrawn.

Independent claims 4, 8, and 20 have been amended to more clearly define the present invention, and to delete "a" in the term "a DC power storage means". Claim 20 has also been amended to change "said" to "the".

Dependent claim 22 has been rewritten in independent form including all of the limitations of base claim 20 as base claim 20 appeared prior to the present amendment, such that the new limitation which has been added to base claim 20 in the present amendment is not included in independent claim 22 as it

appears in the present amendment. The formal changes which have been made to base claim 20 in the present amendment are included in independent claim 22 as it appears in the present amendment, i.e. "said DC power supply means" has been changed to "said DC power storage means"; "a" in the term "a DC power storage means" has been deleted; and "said" has been changed to "the".

Accordingly, it is submitted that independent claim 22 as it appears in the present amendment is substantially identical to dependent claim 22 as it was considered in the Office Action of December 16, 2002, except that claim 22 is now in independent form, such that the Examiner cannot make the next Office Action final if it includes any new ground of rejection of independent claim 22.

Claims 4-10 were rejected under 35 USC 102(e) as being anticipated by Faberman et al. (Faberman) (U.S. Patent No. 5,978,236) for the reasons set forth on pages 2-3 of the Office Action of December 16, 2002.

Claims 11-12 were rejected under 35 USC 103(a) as being unpatentable over Faberman in view of Yeh (U.S. Patent No. 5,347,164) for the reasons set forth on page 4 of the Office Action of December 16, 2002.

Claim 13 was rejected under 35 USC 103(a) as being unpatentable over Faberman in view of Nagai et al. (Nagai) (U.S. Patent No. 6,057,609) for the reasons set forth on pages 4-5 of the Office Action of December 16, 2002.

Claim 14 was rejected under 35 USC 103(a) as being unpatentable over Kageyama (not Kegeyama as indicated by the Examiner) (U.S. Patent No. 5,612,581), with the Examiner also referring to Shimamori (U.S. Patent No.

5,737,202) without including this reference in the statement of the rejection, for the reasons set forth on page 5 of the Office Action of December 16, 2002.

Claims 16-18 and 21 were rejected under 35 USC 103(a) as being unpatentable over Faberman in view of Brand et al. (Brand) (U.S. Patent No. 5,901,057), with the Examiner also referring to Shimamori without including this reference in the statement of the rejection, for the reasons set forth on pages 5-6 of the Office Action of December 16, 2002.

Claims 19-20 were rejected under 35 USC 103(a) as being unpatentable over Faberman in view of Levran et al. (Levran) (U.S. Patent No. 5,982,645) or Brand for the reasons set forth on pages 6-7 of the Office Action of December 16, 2002.

Claim 22 was rejected under 35 USC 103(a) as being unpatentable over Faberman in view of Kageyama (not Kegeyama as indicated by the Examiner), with the Examiner also referring to Shimamori without including this reference in the statement of the rejection, for the reasons set forth on pages 7-8 of the Office Action of December 16, 2002.

The rejection of claim 22 is respectfully traversed insofar as it may be deemed to be applicable to these claims in their present form, and the rejections of claim 4-14 and 16-21 are respectfully traversed insofar as they may be deemed to be applicable to claims 4-14 and 16-21 in their present form.

At the outset, it is noted that the Examiner rejected independent claim 20 under 35 USC 103(a) as being unpatentable over Faberman in view of Levran or Brand, and rejected dependent claim 22 which depended from independent

claim 20 under 35 USC 103(a) as being unpatentable over Faberman in view of Kageyama. Thus, the Examiner did not rely on Levran and Brand in the rejection of dependent claim 22 in the Office Action of December 16, 2002.

The Examiner relied on Levran and Brand in the rejection of independent claim 20 in the Office Action of December 16, 2002, to show the feature of independent claim 20 wherein said control circuit . . . effects control to suppress harmonic current in the received AC power, which the Examiner refers to as "power factor correcting", stating as follows in pertinent part in explaining the rejection of independent claim 20 on page 7 of the Office Action of December 16, 2002:

> However, Faberman et al does not disclose power factor correcting.
>
> Levran et al, col. 3 lines 30-35 teach the AC/DC converter has unity power factor and /or Brand et al teach the power supply employs power factor correction (Abstract).
>
> Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ power factor correction techniques in order to maximize circuit efficiency, as is well known in the art and desired, that power factor correction provides.

It is submitted that the feature of independent claim 20 wherein said control circuit . . . effects control to suppress harmonic current in the received AC power which the Examiner considers to be taught by Levran or Brand was also recited in dependent claim 22 which depended from independent claim 20 at the time the Office Action of December 16, 2002, was issued by virtue of dependent claim 22's dependency from independent claim 20. This feature is

now explicitly recited in independent claim 22 as it appears in the present amendment in the form wherein the control circuit . . . effects control to suppress harmonic current in the received AC power.

Since the Examiner relied only on Faberman and Kageyama in the rejection of dependent claim 22 in the Office Action of December 16, 2002, and did not rely on Levran or Brand which the Examiner considers to teach the feature wherein said control circuit . . . effects control to suppress harmonic current in the received AC power which was recited in dependent claim 22 at the time the Office Action of December 16, 2002, was issued by virtue of dependent claim 22's dependency from independent claim 20, and is now explicitly recited in independent claim 22 as it appears in the present amendment in the form wherein the control circuit . . . effects control to suppress harmonic current in the received AC power, it is submitted that independent claim 22 is allowable over Faberman and Kageyama by the Examiner's own admission because Faberman and Kageyama do not disclose or suggest "power factor correcting" as recited in independent claim 22, i.e. the feature of independent claim 22 wherein the control circuit . . . effects control to suppress harmonic current in the received AC power, as evidenced by the Examiner's reliance on Levran and Brand to show this feature in the rejection of independent claim 20 from which claim 22 previously depended in the Office Action of December 16, 2002.

Since Faberman and Kageyama do not disclose or suggest the feature of independent claim 22 wherein the control circuit . . . effects control to suppress

harmonic current in the received AC power for the reasons discussed above, it is submitted that independent claim 22 patentably distinguishes over Faberman and Kageyama in the sense of 35 USC 103(a), and it is respectfully requested that the rejection of independent claim 22 under 35 USC 103(a) as being unpatentable over Faberman in view of Kageyama be withdrawn.

Independent claim 4 now recites, inter alia, that the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means and to be substantially equal to the output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage higher than the effective value of the AC input voltage while the DC converter supplies the electric power received from the DC power storage means to the input of the DC/DC converter.

Independent claim 8 now recites, inter alia, that when electric power is interrupted or the AC/DC converter cannot maintain sufficient electric power output to be consumed by the load, the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means and to be substantially equal to the output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage higher than the effective value of the AC input voltage while the DC converter supplies the electric power from the DC power storage means to the input of the DC/DC converter.

Independent claim 20 now recites, inter alia, that the DC converter controls an output voltage of the DC converter to be substantially equal to the

output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage while the DC power storage means supplies electric power to the DC/DC converter through the DC converter.

The features of claims 4, 8, and 20 which are set forth above are described, for example, on page 5, lines 12-14, and page 13, lines 11-14, of the specification.

It is submitted that the features of claims 4, 8, and 20 which are set forth above are not disclosed or suggested by Faberman because, as described in column 6, lines 30-57, of Faberman, in Fig. 1 of Faberman, AC/DC converter D1A outputs an output voltage of 330 VDC while DC converter 33 outputs an output voltage of 240 VDC which is not substantially equal to the output voltage of 330 VDC of AC/DC converter D1A as would be required for Faberman to disclose or suggest the features of claims 4, 8, and 20 which are set forth above. The different voltages of 330 VDC and 240 VDC which are output from AC/DC converter D1A and DC converter 33 and are input to DC/AC converter T1A in Fig. 1 of Faberman require DC/AC converter T1A to have a complicated control circuit because it has to accommodate these different input voltages.

In contrast, the DC/AC converter of the present invention as recited in claims 4, 8, and 20 can have a simple control circuit because it only has to accommodate one input voltage.

Accordingly, for the reasons discussed above, it is submitted that Faberman does not disclose or suggest the feature of claim 4 wherein the DC

converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means and to be substantially equal to the output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage higher than the effective value of the AC input voltage while the DC converter supplies the electric power received from the DC power storage means to the input of the DC/DC converter; or the feature of claim 8 wherein, when electric power is interrupted or the AC/DC converter cannot maintain sufficient electric power output to be consumed by the load, the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means and to be substantially equal to the output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage higher than the effective value of the AC input voltage while the DC converter supplies the electric power from the DC power storage means to the input of the DC/DC converter; or the feature of claim 20 wherein the DC converter controls an output voltage of the DC converter to be substantially equal to the output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage while the DC power storage means supplies electric power to the DC/DC converter through the DC converter.

Nor is it seen where these features of claims 4, 8, and 20 are disclosed or suggested by Yeh, Nagai, Kageyama, Shimamori, Brand, and Levran.

Since Faberman, Yeh, Nagai, Kageyama, Shimamori, Brand, and Levran do not disclose or suggest the features of independent claims 4, 8, and 20

discussed above, it is submitted that independent claims 4, 8, and 20 and claims 5-7, 9-14, 16-19, and 21 depending from independent claims 4 and 8 patentably distinguish over Faberman, Yeh, Nagai, Kageyama, Shimamori, Brand, and Levran in the sense of 35 USC 102(e) and 103(a), and it is respectfully requested that the rejections of claims 4-14 and 16-21 under 35 USC 103(a) as being unpatentable over Faberman, Yeh, Nagai, Kageyama, Shimamori, Brand, and Levran be withdrawn.

Although dependent claims 5-7, 9-14, 16-19, and 21 are considered to be allowable by virtue of their dependency from allowable independent claims 4 and 8, it is noted that these dependent claims also recite further features of the present invention which are not seen to be disclosed or suggested by the prior art.

As recognized by the Examiner, the other reference cited but not relied upon neither discloses nor suggests the present invention, and thus no further discussion of this other reference is deemed necessary at this time.

It is submitted that all of the Examiner's objections and rejections have been overcome, and that the application is now in condition for allowance. Reconsideration of the application and an action of a favorable nature are respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any

overpayment of fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (500.38034CX1).

Respectfully submitted,

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Attachment

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Changes made to the application by the present amendment are indicated below, with brackets indicating deleted matter and underlining indicating added matter.

IN THE CLAIMS

Claims 4, 8, 20, and 22 have been amended as follows:

--4. (Twice Amended) A power supply comprising:

an AC/DC converter which receives AC power having an AC input voltage, converts the AC power into DC power, and outputs the DC power, the AC/DC converter including a control circuit which controls an output voltage of the DC power output from the AC/DC converter, wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage higher than an effective value of the AC input voltage;

a DC/DC converter which receives the DC power from the AC/DC converter and controls a level of an output voltage of the DC/DC converter to be equal to a level of a voltage to be used by a load to provide a controlled output

voltage of the DC/DC converter while the DC/DC converter supplies the controlled output voltage of the DC/DC converter to the load;

a DC converter which is connected to an input of the DC/DC converter; and

[a] DC power storage means which supplies electric power to the DC/DC converter through the DC converter;

wherein the DC converter is bidirectional to enable the DC converter to charge and discharge the DC power storage means;

wherein the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means and to be substantially equal to the output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage higher than the effective value of the AC input voltage while the DC converter supplies the electric power received from the DC power storage means to the input of the DC/DC converter;

wherein the DC converter includes:

a first converter having an AC terminal, and a DC terminal connected to the input of the DC/DC converter;

a transformer having a high-voltage side winding connected to the AC terminal of the first converter, and a low-voltage side winding; and

a second converter having an AC terminal connected to the low-voltage side winding, and a DC terminal connected to the DC power storage means; and

wherein the transformer separates the DC power storage means from the AC/DC converter and from the DC/DC converter.--

--8. (Twice Amended) A power supply comprising:

an AC/DC converter which receives AC power having an AC input voltage, converts the AC power into DC power, and outputs the DC power, the AC/DC converter including a control circuit which controls an output voltage of the DC power output from the AC/DC converter, wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage higher than an effective value of the AC input voltage;

a DC/DC converter which receives the DC power from the AC/DC converter and controls a level of an output voltage of the DC/DC converter to be equal to a level of a voltage to be used by a load to provide a controlled output voltage of the DC/DC converter while the DC/DC converter supplies the controlled output voltage of the DC/DC converter to the load;

a DC converter which is connected to an input of the DC/DC converter; and

[a] DC power storage means which supplies electric power to the DC/DC converter through the DC converter;

wherein the DC converter is bidirectional to enable the DC converter to charge and discharge the DC power storage means;

wherein, when electric power is interrupted or the AC/DC converter cannot maintain sufficient electric power output to be consumed by the load, the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means and to be substantially equal to the output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage higher than the effective value of the AC input voltage while the DC converter supplies the electric power from the DC power storage means to the input of the DC/DC converter;

wherein the DC converter includes:

a first converter having an AC terminal, and a DC terminal connected to the input of the DC/DC converter;

a transformer having a high-voltage side winding connected to the AC terminal of the first converter, and a low-voltage side winding; and

a second converter having an AC terminal connected to the low-voltage side winding, and a DC terminal connected to the DC power storage means; and

wherein the transformer separates the DC power storage means from the AC/DC converter and from the DC/DC converter.--

--20. (Twice Amended) A power supply comprising a plurality of power supply units connected in parallel with one another, wherein each of [said] the plurality of power supply units includes:

an AC/DC converter which receives AC power, converts [said] the AC power into DC power, and outputs [said] the DC power, [said] the AC/DC converter including a control circuit which controls an output voltage of [said] the DC power output from [said] the AC/DC converter, wherein [said] the control circuit controls [said] the output voltage of [said] the DC power of [said] the AC/DC converter to be equal to a predetermined DC voltage;

a DC/DC converter which receives [said] the DC power from [said] the AC/DC converter, and controls a level of an output voltage of [said] the DC/DC converter to be equal to a level of a voltage to be used by a load while [said] the DC/DC converter supplies [said] the output voltage to [said] the load;

a DC converter which is connected to an input of [said] the DC/DC converter; and

[a] DC power storage means which supplies electric power to [said] the DC/DC converter through [said] the DC converter, [said] the DC converter being bidirectional to charge and discharge [said] the DC power [supply] storage means;

wherein [said] the control circuit controls [said] the output voltage of [said] the DC power of [said] the AC/DC converter to be equal to a predetermined DC voltage on the basis of ON/OFF actuation of a semiconductor switching device of a main circuit of [said] the AC/DC converter and effects control to suppress harmonic current in the received AC power; and

wherein the DC converter controls an output voltage of the DC converter to be substantially equal to the output voltage of the DC power of the

AC/DC converter which is controlled to be equal to the predetermined DC voltage while the DC power storage means supplies electric power to the DC/DC converter through the DC converter.--

--22. (Twice Amended) A power supply [according to claim 20,] comprising a plurality of power supply units connected in parallel with one another, wherein each of the plurality of power supply units includes:

an AC/DC converter which receives AC power, converts the AC power into DC power, and outputs the DC power, the AC/DC converter including a control circuit which controls an output voltage of the DC power output from the AC/DC converter, wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage;

a DC/DC converter which receives the DC power from the AC/DC converter, and controls a level of an output voltage of the DC/DC converter to be equal to a level of a voltage to be used by a load while the DC/DC converter supplies the output voltage to the load;

a DC converter which is connected to an input of the DC/DC converter; and

DC power storage means which supplies electric power to the DC/DC converter through the DC converter, the DC converter being bidirectional to charge and discharge the DC power storage means;

wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage on the basis of ON/OFF actuation of a semiconductor switching device of a main circuit of the AC/DC converter and effects control to suppress harmonic current in the received AC power; and

wherein the DC converter includes a plurality of multiplexed DC converters connected in parallel.--